

## Photometric Test Report

### Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-2017

Prepared For

**RAB Lighting Inc.**

Prepared By

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Revised Date: N/A

## 1.0 Test Summary

DLC Technical Requirements V5.1

2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	IES LM-79-2008	1500		3259
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	133.6
		110	125	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		24.4
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2014	20.00%	120V	8.13
			277V	13.83
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
			277V	0.935
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	IES LM-79-2008	7 steps	5029±283	4905
		4 steps	5029±220	
Minimum CRI (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥80		83.5
Minimum R9 (Integrating Sphere – Section 4.1)	IES LM-79-2008 CIE13.3-1995	≥0		15
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		84
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		96
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-60°) (Goniophotometer – Section 4.2)	IES LM-79-2008	≥75%		74.7%
Discomfort Glare (UGR) (Goniophotometer – Section 4.2)	IES LM-79-2008	Standard	Premium	22.8
		N/A	<22	
Spacing Criterion (Goniophotometer – Section 4.2)	IES LM-79-2008	0°-180°	1.0-2.0	1.26
		90°-270°	1.0-2.0	1.32
Input Voltage (V)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Cast		277.0
(Goniophotometer – Section 4.2)		Non-Worst Case		120.0
Input Current (A)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		0.094
(Goniophotometer – Section 4.2)		Non-Worst Case		0.202
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	IES LM-79-2008	Worst Case		24.4
(Goniophotometer – Section 4.2)		Non-Worst Case		24.2

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2024-01-25	C-SWISH2X2@25W5000K	240119001-S1
2	Goniophotometer Test	2024-01-25	C-SWISH2X2@25W5000K	240119001-S1
3	THD and PF Test	2024-01-25	C-SWISH2X2@25W5000K	240119001-S1

### Remark (If any)

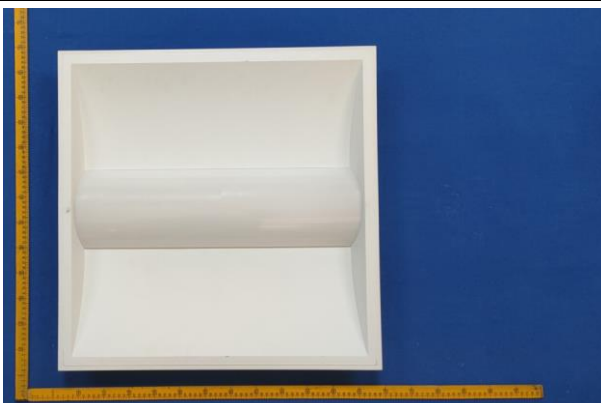
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- This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

## 3.0 Product Description

Luminaire Description: Model No. C-SWISH2X2@25W5000K, color tunable from 3500K, 4000K and 5000K.

Electrical Specification: 120-277Vac, 50/60Hz

### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

<b>Model No.</b>	C-SWISH2X2@25W5000K	<b>Sample ID</b>	240119001-S1
<b>Operate time (Min.)</b>	10	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

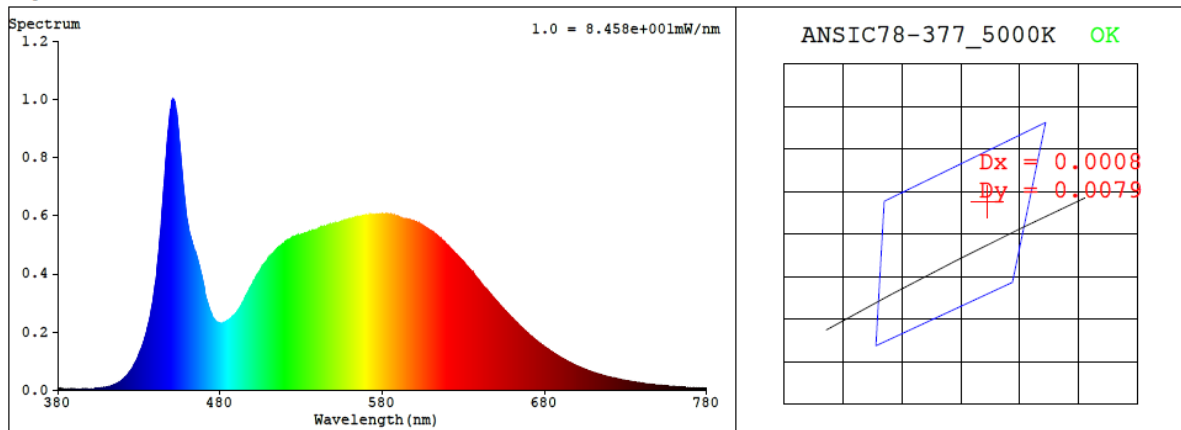
Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780nm.</p>

### Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.202	24.2	0.996
277.0	60	0.094	24.4	0.935

CCT (K)	CRI	R9	Duv	Rf	Rg	IES Rcs,h1
4905	83.5	15	0.0036	84	96	-11%

## 4.1 Integrating Sphere Test



### Colorimetric Parameters

Chromaticity Coordinate:  $x = 0.3487$   $y = 0.3617$  /  $u' = 0.2099$   $v' = 0.4900$  ( $duv=3.60e-03$ )

CCT= 4905K Prcp WL: Ld=570.8nm Purity=13.2%

Peak WL: Lp=451nm FWHM: =20.5nm Ratio:R=15.9% G=79.8% B=4.4%

Render Index: Ra = 83.5 AvgR = 76.4 TM30:Rf=84 Rg=96

EEL: 0.10356 A++ Highest

R1 =81 R2 =88 R3 =93 R4 =82 R5 =81 R6 =83 R7 =89

R8 =70 R9 =15 R10=71 R11=81 R12=56 R13=83 R14=96 R15=76

## 4.1 Integrating Sphere Test

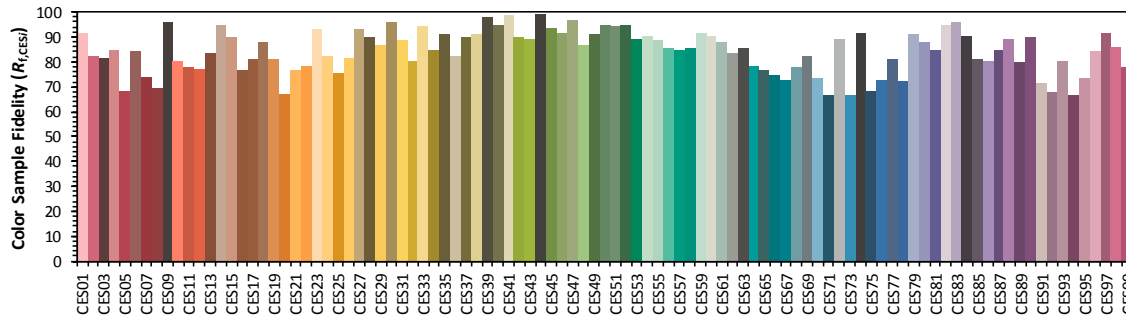
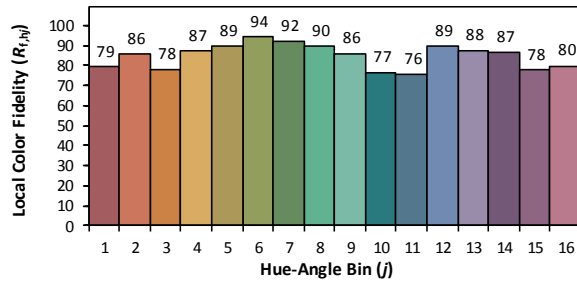
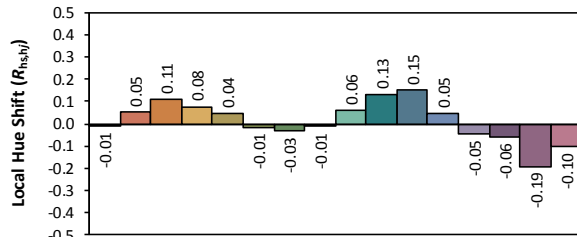
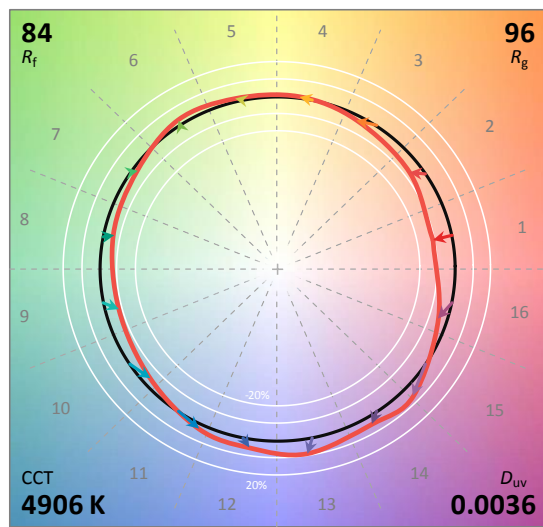
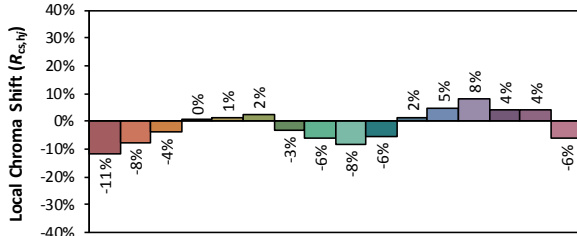
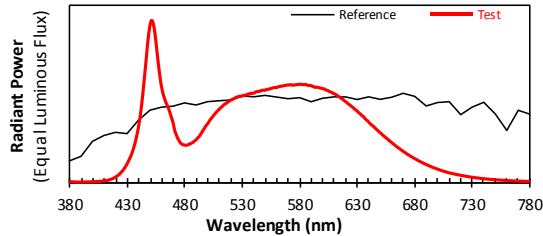
### ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2024/1/30

Model: C-SWISH2X2@25W5000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3486  
 $y$  0.3616  
 $u'$  0.2100  
 $v'$  0.4900

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  15

## 4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	5.50E-06	447	8.22E-04	514	4.80E-04	581	6.05E-04	648	3.22E-04	715	5.29E-05
381	5.30E-06	448	8.91E-04	515	4.85E-04	582	6.05E-04	649	3.15E-04	716	5.11E-05
382	5.00E-06	449	9.46E-04	516	4.88E-04	583	6.04E-04	650	3.09E-04	717	4.98E-05
383	5.00E-06	450	9.84E-04	517	4.94E-04	584	6.04E-04	651	3.03E-04	718	4.81E-05
384	3.40E-06	451	1.00E-03	518	4.99E-04	585	6.05E-04	652	2.96E-04	719	4.72E-05
385	4.10E-06	452	9.89E-04	519	5.04E-04	586	6.02E-04	653	2.90E-04	720	4.58E-05
386	3.40E-06	453	9.58E-04	520	5.09E-04	587	6.00E-04	654	2.84E-04	721	4.42E-05
387	3.30E-06	454	9.12E-04	521	5.11E-04	588	5.98E-04	655	2.78E-04	722	4.29E-05
388	3.50E-06	455	8.50E-04	522	5.15E-04	589	5.99E-04	656	2.72E-04	723	4.17E-05
389	3.20E-06	456	7.83E-04	523	5.18E-04	590	5.98E-04	657	2.66E-04	724	4.03E-05
390	3.50E-06	457	7.21E-04	524	5.23E-04	591	5.93E-04	658	2.60E-04	725	3.92E-05
391	3.50E-06	458	6.66E-04	525	5.27E-04	592	5.92E-04	659	2.54E-04	726	3.79E-05
392	3.70E-06	459	6.14E-04	526	5.28E-04	593	5.88E-04	660	2.48E-04	727	3.66E-05
393	3.70E-06	460	5.77E-04	527	5.31E-04	594	5.88E-04	661	2.42E-04	728	3.55E-05
394	3.90E-06	461	5.45E-04	528	5.33E-04	595	5.89E-04	662	2.37E-04	729	3.44E-05
395	4.90E-06	462	5.23E-04	529	5.31E-04	596	5.86E-04	663	2.32E-04	730	3.35E-05
396	4.20E-06	463	5.02E-04	530	5.35E-04	597	5.84E-04	664	2.25E-04	731	3.24E-05
397	4.10E-06	464	4.84E-04	531	5.37E-04	598	5.83E-04	665	2.19E-04	732	3.15E-05
398	5.00E-06	465	4.70E-04	532	5.39E-04	599	5.81E-04	666	2.15E-04	733	3.04E-05
399	5.40E-06	466	4.51E-04	533	5.39E-04	600	5.79E-04	667	2.10E-04	734	2.94E-05
400	5.20E-06	467	4.30E-04	534	5.42E-04	601	5.79E-04	668	2.04E-04	735	2.85E-05
401	5.90E-06	468	4.08E-04	535	5.46E-04	602	5.75E-04	669	1.99E-04	736	2.79E-05
402	5.90E-06	469	3.85E-04	536	5.45E-04	603	5.70E-04	670	1.95E-04	737	2.65E-05
403	6.70E-06	470	3.58E-04	537	5.50E-04	604	5.69E-04	671	1.89E-04	738	2.59E-05
404	6.70E-06	471	3.24E-04	538	5.50E-04	605	5.66E-04	672	1.85E-04	739	2.51E-05
405	7.40E-06	472	3.04E-04	539	5.51E-04	606	5.61E-04	673	1.79E-04	740	2.45E-05
406	7.80E-06	473	2.85E-04	540	5.51E-04	607	5.59E-04	674	1.75E-04	741	2.36E-05
407	8.70E-06	474	2.69E-04	541	5.55E-04	608	5.56E-04	675	1.70E-04	742	2.27E-05
408	9.70E-06	475	2.57E-04	542	5.60E-04	609	5.51E-04	676	1.67E-04	743	2.20E-05
409	1.03E-05	476	2.46E-04	543	5.60E-04	610	5.48E-04	677	1.61E-04	744	2.14E-05
410	1.12E-05	477	2.39E-04	544	5.63E-04	611	5.45E-04	678	1.58E-04	745	2.08E-05
411	1.23E-05	478	2.34E-04	545	5.62E-04	612	5.40E-04	679	1.54E-04	746	2.00E-05
412	1.34E-05	479	2.32E-04	546	5.66E-04	613	5.35E-04	680	1.49E-04	747	1.95E-05
413	1.51E-05	480	2.31E-04	547	5.68E-04	614	5.31E-04	681	1.45E-04	748	1.89E-05
414	1.71E-05	481	2.30E-04	548	5.69E-04	615	5.26E-04	682	1.42E-04	749	1.84E-05
415	1.89E-05	482	2.32E-04	549	5.69E-04	616	5.21E-04	683	1.37E-04	750	1.79E-05
416	2.22E-05	483	2.34E-04	550	5.70E-04	617	5.16E-04	684	1.33E-04	751	1.74E-05
417	2.40E-05	484	2.38E-04	551	5.73E-04	618	5.12E-04	685	1.30E-04	752	1.65E-05
418	2.80E-05	485	2.40E-04	552	5.75E-04	619	5.05E-04	686	1.26E-04	753	1.60E-05
419	3.21E-05	486	2.45E-04	553	5.75E-04	620	4.99E-04	687	1.23E-04	754	1.58E-05
420	3.66E-05	487	2.48E-04	554	5.78E-04	621	4.95E-04	688	1.20E-04	755	1.52E-05
421	4.09E-05	488	2.55E-04	555	5.81E-04	622	4.88E-04	689	1.16E-04	756	1.48E-05
422	4.68E-05	489	2.59E-04	556	5.82E-04	623	4.82E-04	690	1.13E-04	757	1.44E-05
423	5.25E-05	490	2.65E-04	557	5.85E-04	624	4.77E-04	691	1.10E-04	758	1.39E-05
424	6.03E-05	491	2.74E-04	558	5.85E-04	625	4.70E-04	692	1.06E-04	759	1.35E-05
425	6.74E-05	492	2.81E-04	559	5.86E-04	626	4.66E-04	693	1.03E-04	760	1.29E-05
426	7.60E-05	493	2.90E-04	560	5.85E-04	627	4.59E-04	694	1.00E-04	761	1.25E-05
427	8.64E-05	494	3.01E-04	561	5.89E-04	628	4.53E-04	695	9.67E-05	762	1.21E-05
428	9.69E-05	495	3.12E-04	562	5.92E-04	629	4.47E-04	696	9.41E-05	763	1.20E-05
429	1.08E-04	496	3.24E-04	563	5.93E-04	630	4.42E-04	697	9.15E-05	764	1.17E-05
430	1.22E-04	497	3.35E-04	564	5.94E-04	631	4.35E-04	698	8.89E-05	765	1.12E-05
431	1.36E-04	498	3.47E-04	565	5.95E-04	632	4.28E-04	699	8.61E-05	766	1.06E-05
432	1.52E-04	499	3.56E-04	566	5.97E-04	633	4.22E-04	700	8.36E-05	767	1.03E-05
433	1.66E-04	500	3.65E-04	567	5.99E-04	634	4.15E-04	701	8.11E-05	768	1.02E-05
434	1.85E-04	501	3.76E-04	568	5.99E-04	635	4.09E-04	702	7.84E-05	769	9.70E-06
435	2.07E-04	502	3.87E-04	569	6.01E-04	636	4.04E-04	703	7.58E-05	770	9.40E-06
436	2.31E-04	503	3.95E-04	570	6.02E-04	637	3.94E-04	704	7.37E-05	771	9.10E-06
437	2.57E-04	504	4.05E-04	571	6.01E-04	638	3.88E-04	705	7.12E-05	772	9.00E-06
438	2.89E-04	505	4.14E-04	572	6.03E-04	639	3.81E-04	706	6.93E-05	773	8.80E-06
439	3.22E-04	506	4.22E-04	573	6.03E-04	640	3.75E-04	707	6.71E-05	774	8.40E-06
440	3.64E-04	507	4.31E-04	574	5.99E-04	641	3.66E-04	708	6.53E-05	775	8.20E-06
441	4.09E-04	508	4.39E-04	575	6.02E-04	642	3.60E-04	709	6.29E-05	776	7.90E-06
442	4.64E-04	509	4.45E-04	576	6.02E-04	643	3.54E-04	710	6.06E-05	777	7.60E-06
443	5.28E-04	510	4.53E-04	577	6.04E-04	644	3.49E-04	711	5.94E-05	778	7.50E-06
444	5.98E-04	511	4.60E-04	578	6.04E-04	645	3.42E-04	712	5.75E-05	779	7.40E-06
445	6.70E-04	512	4.66E-04	579	6.05E-04	646	3.35E-04	713	5.59E-05	780	7.40E-06
446	7.43E-04	513	4.73E-04	580	6.07E-04	647	3.28E-04	714	5.45E-05	N/A	N/A



## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

<b>Model No.</b>	C-SWISH2X2@25W5000K	<b>Sample ID</b>	240119001-S1
<b>Operate time (Min.)</b>	30	<b>Stabilization time (Min.)</b>	60
<b>Temperature (°C)</b>	25.0	<b>Humidity (%RH)</b>	42.1

Test Method
<p>The Samples were tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at <math>25 \pm 1^\circ\text{C}</math>, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within <math>\pm 0.2</math> percent under load.</p> <p>The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at <math>1.0^\circ</math> vertical intervals and <math>15^\circ</math> horizontal intervals.</p>

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
<b>WORST CASE</b>	277.0	60	0.094	24.4	0.935
<b>NON-WORST CASE</b>	120.0	60	0.202	24.2	0.996

#### Test Result

Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement
	C0-180	C90-270	C0-180	C90-270		(0°-60°)
3259	160.7	169.7	111.0	130.7	133.6	74.7%

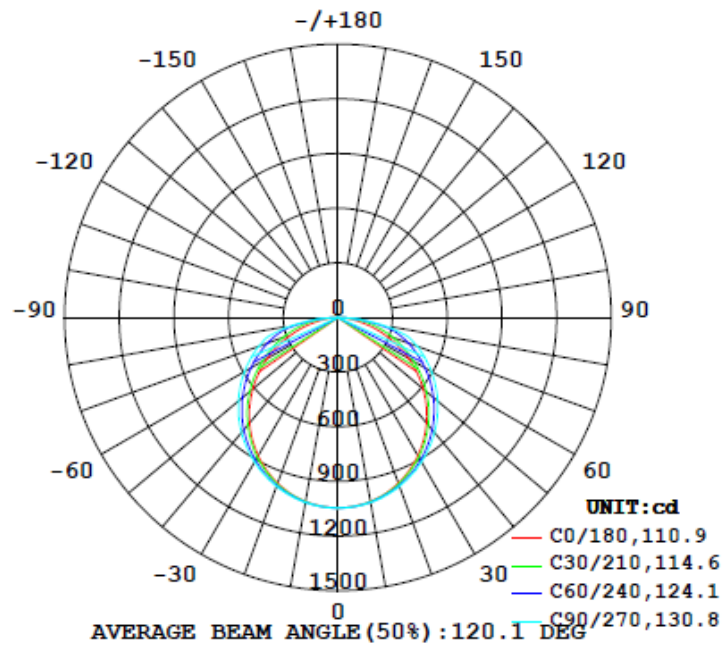
UGR		Spacing Criterion	
Crosswise	Endwise	(0°-180°)	(90°-270°)
19.6	22.8	1.26	1.32



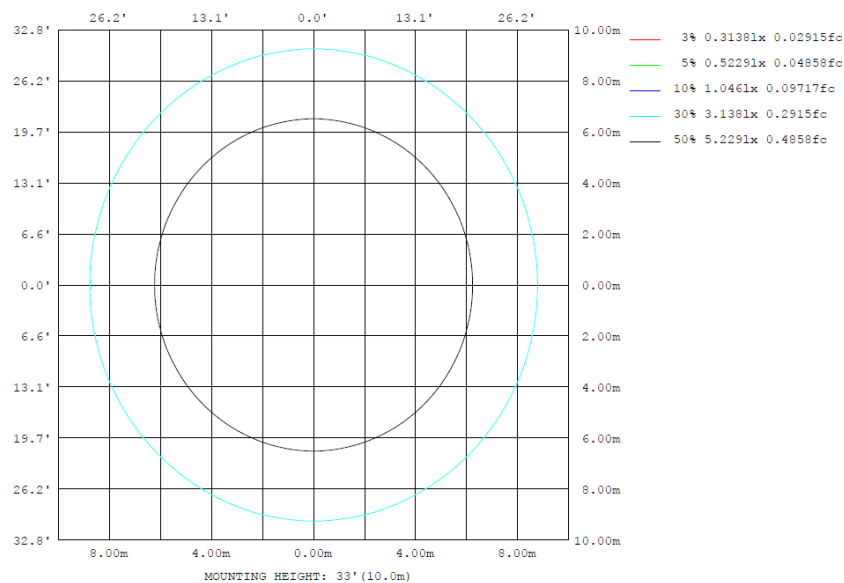
## 4.2 Goniophotometer Test

### Lighting Distribution Curve

**LUMINOUS INTENSITY DISTRIBUTION DIAGRAM**



### Isolux Plot



## 4.2 Goniophotometer Test

### Zonal Lumen Summary

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1026	1028	1031	1028	1026	1028	1031	1028	0- 10	98.97	98.97	3.04,3.04
20	967.9	977.6	986.4	977.6	967.9	977.6	986.4	977.6	10- 20	284.2	383.2	11.8,11.8
30	876.5	896.2	916.2	896.2	876.5	896.2	916.2	896.2	20- 30	433.5	816.7	25.1,25.1
40	755.9	786.8	823.6	786.8	755.9	786.8	823.6	786.8	30- 40	528.8	1346	41.3,41.3
50	610.6	658.2	714.5	658.2	610.6	658.2	714.5	658.2	40- 50	560.5	1906	58.5,58.5
60	446.4	515.2	592.4	515.2	446.4	515.2	592.4	515.2	50- 60	527.5	2434	74.7,74.7
70	269.7	365.8	462.6	365.8	269.7	365.8	462.6	365.8	60- 70	437.1	2871	88.1,88.1
80	100.9	205.2	256.3	205.2	100.9	205.2	256.3	205.2	70- 80	299.9	3170	97.3,97.3
90	0	0	0	0	0	0	0	0	80- 90	88.01	3259	100,100
100	0	0	0	0	0	0	0	0	90-100	0	3259	100,100
110	0	0	0	0	0	0	0	0	100-110	0	3259	100,100
120	0	0	0	0	0	0	0	0	110-120	0	3259	100,100
130	0	0	0	0	0	0	0	0	120-130	0	3259	100,100
140	0	0	0	0	0	0	0	0	130-140	0	3259	100,100
150	0	0	0	0	0	0	0	0	140-150	0	3259	100,100
160	0	0	0	0	0	0	0	0	150-160	0	3259	100,100
170	0	0	0	0	0	0	0	0	160-170	0	3259	100,100
180	0	0	0	0	0	0	0	0	170-180	0	3259	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Zonal (lm)		Total (lm)		Percent
0-10	98.97	0-10	98.97	3.04%
10-20	284.23	0-20	383.20	11.76%
20-30	433.50	0-30	816.70	25.06%
30-40	528.80	0-40	1345.50	41.29%
40-50	560.55	0-50	1906.05	58.49%
50-60	527.47	0-60	2433.52	74.68%
60-70	437.06	0-70	2870.58	88.10%
70-80	299.91	0-80	3170.49	97.30%
80-90	88.01	0-90	3258.50	100.00%
90-100	0.00	0-100	3258.50	100.00%
100-110	0.00	0-110	3258.50	100.00%
110-120	0.00	0-120	3258.50	100.00%
120-130	0.00	0-130	3258.50	100.00%
130-140	0.00	0-140	3258.50	100.00%
140-150	0.00	0-150	3258.50	100.00%
150-160	0.00	0-160	3258.50	100.00%
160-170	0.00	0-170	3258.50	100.00%
170-180	0.00	0-180	3258.50	100.00%

## 4.2 Goniophotometer Test

UGR – Uncorrected Table:

**UGR TABLE - UNCORRECTED**

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	11.0	12.7	11.4	13.1	13.4	12.4	14.1	12.7	14.4	14.7
	3H	12.8	14.3	13.2	14.7	15.0	14.9	16.5	15.3	16.8	17.2
	4H	13.4	14.9	13.8	15.2	15.6	16.1	17.6	16.5	18.0	18.3
	6H	13.9	15.2	14.3	15.6	16.0	17.1	18.5	17.5	18.8	19.2
	8H	14.0	15.3	14.4	15.7	16.1	17.4	18.7	17.8	19.1	19.5
	12H	14.0	15.3	14.5	15.7	16.1	17.6	18.9	18.0	19.2	19.7
4H	2H	12.0	13.4	12.4	13.8	14.1	13.0	14.4	13.4	14.8	15.2
	3H	14.0	15.2	14.4	15.6	16.0	15.8	17.0	16.2	17.4	17.8
	4H	14.8	15.9	15.2	16.3	16.7	17.2	18.3	17.6	18.7	19.2
	6H	15.3	16.3	15.8	16.7	17.2	18.3	19.3	18.8	19.7	20.2
	8H	15.5	16.4	15.9	16.8	17.3	18.7	19.6	19.2	20.1	20.5
	12H	15.6	16.4	16.1	16.9	17.3	19.0	19.8	19.4	20.3	20.7
8H	4H	15.5	16.4	15.9	16.8	17.3	17.5	18.4	18.0	18.9	19.3
	6H	16.2	17.0	16.7	17.5	17.9	18.8	19.6	19.3	20.1	20.6
	8H	16.5	17.2	17.0	17.7	18.1	19.3	20.0	19.8	20.5	21.0
	12H	16.6	17.2	17.1	17.7	18.3	19.6	20.2	20.1	20.7	21.3
12H	4H	15.6	16.4	16.1	16.9	17.4	17.5	18.4	18.0	18.9	19.3
	6H	16.4	17.1	17.0	17.6	18.1	18.9	19.6	19.4	20.0	20.6
	8H	16.8	17.4	17.3	17.9	18.4	19.4	20.0	19.9	20.5	21.1

Maximum UGR = 21.3

UGR – Corrected Table:

**UGR TABLE - CORRECTED**

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.1	16.8	15.5	17.2	17.5	16.5	18.2	16.8	18.5	18.8
	3H	16.9	18.4	17.3	18.8	19.1	19.0	20.6	19.4	20.9	21.3
	4H	17.5	19.0	17.9	19.3	19.7	20.2	21.7	20.6	22.1	22.4
	6H	18.0	19.3	18.4	19.7	20.1	21.2	22.6	21.6	22.9	23.3
	8H	18.1	19.4	18.5	19.8	20.2	21.5	22.8	21.9	23.2	23.6
	12H	18.1	19.4	18.6	19.8	20.2	21.7	23.0	22.1	23.3	23.8
4H	2H	16.1	17.5	16.5	17.9	18.2	17.1	18.5	17.5	18.9	19.3
	3H	18.1	19.3	18.5	19.7	20.1	19.9	21.1	20.3	21.5	21.9
	4H	18.9	20.0	19.3	20.4	20.8	21.3	22.4	21.7	22.8	23.3
	6H	19.4	20.4	19.9	20.8	21.3	22.4	23.4	22.9	23.8	24.3
	8H	19.6	20.5	20.0	20.9	21.4	22.8	23.7	23.3	24.2	24.6
	12H	19.7	20.5	20.2	21.0	21.4	23.1	23.9	23.5	24.4	24.8
8H	4H	19.6	20.5	20.0	20.9	21.4	21.6	22.5	22.1	23.0	23.4
	6H	20.3	21.1	20.8	21.6	22.0	22.9	23.7	23.4	24.2	24.7
	8H	20.6	21.3	21.1	21.8	22.2	23.4	24.1	23.9	24.6	25.1
	12H	20.7	21.3	21.2	21.8	22.4	23.7	24.3	24.2	24.8	25.4
12H	4H	19.7	20.5	20.2	21.0	21.5	21.6	22.5	22.1	23.0	23.4
	6H	20.5	21.2	21.1	21.7	22.2	23.0	23.7	23.5	24.1	24.7
	8H	20.9	21.5	21.4	22.0	22.5	23.5	24.1	24.0	24.6	25.2

Maximum UGR = 25.4

## 4.2 Goniophotometer Test

### Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1046	1045	1045	1046	1045	1045	1046	1045	1045	1046	1045	1045	1046	1045	1045	1046	1045	1045	1046
5	1040	1040	1041	1042	1041	1042	1042	1042	1041	1042	1041	1040	1040	1040	1041	1042	1041	1042	1042
10	1026	1026	1027	1028	1030	1029	1031	1029	1030	1028	1027	1026	1026	1026	1027	1028	1030	1029	1031
15	1002	1003	1004	1007	1008	1010	1012	1010	1008	1007	1004	1003	1002	1003	1004	1007	1008	1010	1012
20	968	969	973	978	982	984	986	984	982	978	973	969	968	969	973	978	982	984	986
25	926	929	934	941	948	952	954	952	948	941	934	929	926	929	934	941	948	952	954
30	877	880	886	896	906	913	916	913	906	896	886	880	877	880	886	896	906	913	916
35	819	822	831	844	858	867	873	867	858	844	831	822	819	822	831	844	858	867	873
40	756	759	771	787	805	818	824	818	805	787	771	759	756	759	771	787	805	818	824
45	686	690	705	725	746	763	771	763	746	725	705	690	686	690	705	725	746	763	771
50	611	617	634	658	684	706	715	706	684	658	634	617	611	617	634	658	684	706	715
55	531	538	559	588	619	644	654	644	619	588	559	538	531	538	559	588	619	644	654
60	446	455	480	515	551	580	592	580	551	515	480	455	446	455	480	515	551	580	592
65	359	370	400	441	482	514	528	514	482	441	400	370	359	370	400	441	482	514	528
70	270	284	320	366	410	446	463	446	410	366	320	284	270	284	320	366	410	446	463
75	182	200	241	290	338	376	393	376	338	290	241	200	182	200	241	290	338	376	393
80	101	121	164	205	228	246	256	246	228	205	164	121	101	121	164	205	228	246	256
85	35.7	48.0	70.9	83.3	90.6	95.8	101	95.8	90.6	83.3	70.9	48.0	35.7	48.0	70.9	83.3	90.6	95.8	101
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--2

UNIT: cd

C (DEG) γ (DEG)	285	300	315	330	345														
0	1045	1045	1046	1045	1045														
5	1042	1041	1042	1041	1040														
10	1029	1030	1028	1027	1026														
15	1010	1008	1007	1004	1003														
20	984	982	978	973	969														
25	952	948	941	934	929														
30	913	906	896	886	880														
35	867	858	844	831	822														
40	818	805	787	771	759														
45	763	746	725	705	690														
50	706	684	658	634	617														
55	644	619	588	559	538														
60	580	551	515	480	455														
65	514	482	441	400	370														
70	446	410	366	320	284														
75	376	338	290	241	200														
80	246	228	205	164	121														
85	95.8	90.6	83.3	70.9	48.0														
90	0.00	0.00	0.00	0.00	0.00														
95	0.00	0.00	0.00	0.00	0.00														
100	0.00	0.00	0.00	0.00	0.00														
105	0.00	0.00	0.00	0.00	0.00														
110	0.00	0.00	0.00	0.00	0.00														
115	0.00	0.00	0.00	0.00	0.00														
120	0.00	0.00	0.00	0.00	0.00														
125	0.00	0.00	0.00	0.00	0.00														
130	0.00	0.00	0.00	0.00	0.00														
135	0.00	0.00	0.00	0.00	0.00														
140	0.00	0.00	0.00	0.00	0.00														
145	0.00	0.00	0.00	0.00	0.00														
150	0.00	0.00	0.00	0.00	0.00														
155	0.00	0.00	0.00	0.00	0.00														
160	0.00	0.00	0.00	0.00	0.00														
165	0.00	0.00	0.00	0.00	0.00														
170	0.00	0.00	0.00	0.00	0.00														
175	0.00	0.00	0.00	0.00	0.00														
180	0.00	0.00	0.00	0.00	0.00														

## 4.0 LM-79 Measurement and Test Results

### 4.3 THD and PF Test

<b>Model No.</b>	C-SWISH2X2@25W5000K	<b>Sample ID</b>	240119001-S1
<b>Temperature (°C)</b>	25.4	<b>Humidity (%RH)</b>	41.0

<b>Test Method</b>
<p>The samples were tested according to the ANSI C82.77:2014</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at <math>25 \pm 1^{\circ}\text{C}</math>. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated.</p>

### Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.202	24.2	0.996	8.13
277.0	60	0.094	24.4	0.935	13.83

## 5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2023-11-08	2024-11-07
NTC-F01-006	2.0 meter Integrating Sphere	2023-11-08	2024-11-07
NTC-F01-012	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-013	Standard Lamp	2023-11-02	2024-11-01
NTC-F01-031	Digital Power Meter	2023-08-25	2024-08-24
NTC-F01-019	Temperature & Humidity Meter	2023-11-06	2024-11-05

\*\*\*\*\*End of Report\*\*\*\*\*